//Design



**//Code**

**package** contactList;

**import** java.io.\*;

**import** java.util.\*;

**public** **class** ContactListProgram {

**public** **static** **void** main(String[] args) {

Scanner scanner = **new** Scanner(System.***in***);

System.***out***.print("Enter the name of the file to store the contact list: ");

String fileName = scanner.nextLine();

TreeMap<String, Contact> contactList = **new** TreeMap<>();

**while** (**true**) {

System.***out***.println("\nContact List Menu:");

System.***out***.println("1. Add a contact");

System.***out***.println("2. Delete a contact");

System.***out***.println("3. Display the contact list");

System.***out***.println("4. Exit");

System.***out***.print("Enter your choice (1-4): ");

**int** choice = scanner.nextInt();

scanner.nextLine(); // Consume the newline character

**switch** (choice) {

**case** 1:

*addContact*(scanner, contactList);

**break**;

**case** 2:

*deleteContact*(scanner, contactList);

**break**;

**case** 3:

*displayContactList*(contactList);

**break**;

**case** 4:

*writeContactListToFile*(fileName, contactList);

System.***out***.println("Exiting the program. Contact list saved to " + fileName);

System.*exit*(0);

**default**:

System.***out***.println("Invalid choice. Please enter a number between 1 and 4.");

}

}

}

**private** **static** TreeMap<String, Contact> readContactListFromFile(String fileName) {

TreeMap<String, Contact> contactList = **new** TreeMap<>();

**try** (ObjectInputStream ois = **new** ObjectInputStream(**new** FileInputStream(fileName))) {

contactList = (TreeMap<String, Contact>) ois.readObject();

System.***out***.println("Contact list loaded from " + fileName);

} **catch** (FileNotFoundException e) {

System.***out***.println("No existing contact list found. Creating a new one.");

} **catch** (IOException | ClassNotFoundException e) {

e.printStackTrace();

}

**return** contactList;

}

**private** **static** **void** writeContactListToFile(String fileName, TreeMap<String, Contact> contactList) {

**try** (ObjectOutputStream oos = **new** ObjectOutputStream(**new** FileOutputStream(fileName))) {

oos.writeObject(contactList);

} **catch** (IOException e) {

e.printStackTrace();

}

}

**private** **static** **void** addContact(Scanner scanner, TreeMap<String, Contact> contactList) {

System.***out***.print("Enter first name: ");

String firstName = scanner.nextLine();

System.***out***.print("Enter last name: ");

String lastName = scanner.nextLine();

System.***out***.print("Enter phone number: ");

String phoneNumber = scanner.nextLine();

System.***out***.print("Enter email address: ");

String emailAddress = scanner.nextLine();

Contact newContact = **new** Contact(firstName, lastName, phoneNumber, emailAddress);

contactList.put(lastName, newContact);

System.***out***.println("Contact added: " + newContact);

}

**private** **static** **void** deleteContact(Scanner scanner, TreeMap<String, Contact> contactList) {

System.***out***.print("Enter the last name of the contact to delete: ");

String lastNameToDelete = scanner.nextLine();

Contact removedContact = contactList.remove(lastNameToDelete);

**if** (removedContact != **null**) {

System.***out***.println("Contact deleted: " + removedContact);

} **else** {

System.***out***.println("Contact not found with last name: " + lastNameToDelete);

}

}

**private** **static** **void** displayContactList(TreeMap<String, Contact> contactList) {

**if** (contactList.isEmpty()) {

System.***out***.println("Contact list is empty.");

} **else** {

System.***out***.println("Contact List:");

**for** (Contact contact : contactList.values()) {

System.***out***.println(contact);

}

}

}

// Contact class representing a person's contact information

**private** **static** **class** Contact **implements** Serializable {

**private** String firstName;

**private** String lastName;

**private** String phoneNumber;

**private** String emailAddress;

**public** Contact(String firstName, String lastName, String phoneNumber, String emailAddress) {

**this**.firstName = firstName;

**this**.lastName = lastName;

**this**.phoneNumber = phoneNumber;

**this**.emailAddress = emailAddress;

}

@Override

**public** String toString() {

**return** "Contact{" +

"firstName='" + firstName + '\'' +

", lastName='" + lastName + '\'' +

", phoneNumber='" + phoneNumber + '\'' +

", emailAddress='" + emailAddress + '\'' +

'}';

}

}//end line

}//end main

**//Output**

